

Appl. No. : 09/397,952
Filed : September 17, 1999

The Examiner has rejected Claims 1-15 and 23-28 under 35 U.S.C. § 102(b) as being anticipated by Ahmad et al. (U.S. Patent No. 5,405,791).

With respect to independent Claim 1, Examiner asserts that Ahmad et al. taught a process for forming a gate structure on a semiconductor substrate that included forming an insulator element region and transforming it into a sidewall spacer (Figures 2-4).

Ahmad et al. showed in Figures 2-4 and taught in the specification (Col. 3, lines 53-57) forming a thermal oxide layer 21 on the surface of the source/drain regions and on the sidewalls of both N-channel and P-channel transistor gates, thereby forming a sidewall spacer and gate bird's beak 22. This is a one-step thermal oxidation process wherein the oxide layers both over the source/drain regions and on the sidewalls are formed at the same time. Ahmad et al. also taught *subsequently* forming an additional nitride layer 24 over the grown oxide layer 21. The nitride layer 24 serves as an etch stop layer. See Col. 3, lines 63-65.

Independent Claim 1 has been amended to recite forming an insulator element region on the substrate and, after forming the insulator element region, transforming a portion of the conductive layer adjacent the insulator element region into a sidewall spacer. The recited method thus comprises two distinct, sequential steps, with the insulator element being formed *prior* to converting the portion of the conductive layer into the sidewall spacer.

In contrast, Ahmad et al. taught *simultaneously* forming oxide over the substrate and the sidewall of the gate electrode. Thus, the oxide 21 of Ahmad et al. does not read on the previously formed insulator element of independent Claim 1. Furthermore, the *subsequent* nitride layer 24 of Ahmad et al. does not meet this limitation either.

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With respect to independent Claims 13, 15 and 23, the Examiner asserts that Ahmad et al. anticipated the claim because of his teachings involving formation of an oxide layer 21 from the conductive layer and also a nitride protective layer 24 thereover.

Applicant respectfully traverses the rejections. Applicant's Claim 13 recites *implanting an insulator element* into the source and drain regions of the substrate, and then oxidizing to form both an oxide spacer and a protective layer including the insulator element. Independent Claim 15 recites *implanting nitrogen* into the source and drain regions, and combining a portion of the substrate and the implanted nitrogen (Claim 15 has also been amended for clarity). Independent Claim 23 recites *forming a nitrogen doped region* within the source and drain regions of a silicon substrate, and then forming a silicon nitride that penetrate under the gate electrode.

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Ahmad et al., in contrast, did not teach *implanting* or doping the substrate with nitrogen or any other "insulator element" that later combines to form a dielectric, contrary to independent Claims 13 and 15. Rather, Ahmad et al. taught only silicon nitride deposition by CVD *over* the substrate, not implanting nitrogen into the substrate. This silicon nitride layer 24 never penetrated under the gate electrode. Accordingly, Applicant respectfully submits that Ahmad et al. did not teach each and every element of independent Claims 13, 15 or 23.

Applicants accordingly submit that that Ahmad et al. failed to teach each and every feature of independent Claims 1, 13, 15 and 23, and so failed to anticipate these claims.

Dependent Claims 2-12, 14 and 24-28 each depend from one of these independent claims and therefore include all the features and limitations thereof. Furthermore, the dependent claims add further distinguishing features of particular utility. Accordingly, Applicants submit that the dependent claims are also allowable over Ahmad et al.

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CONCLUSIONS

In view of the foregoing amendments and remarks, Applicants submit that the application is in condition for allowance. If, however, some issue remains which the Examiner feels may be addressed by Examiner's amendment, the Examiner is cordially invited to call the undersigned for authorization.

Respectfully submitted,

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